WHAT IS CLAIMED IS:

1. An isotopic identification comprising a mathematical array of concentrations of isotopes, ratio of isotope concentrations found in a product, said mathematical array presented in a readable form, said readable form being comparable to analytical results of unknown products, whereby unknown products can be identified and known products can be differentiated from fraudulent products, said readable form being indexed to stored product information, whereby products can be securely traced through manufacturing and the marketplace and distinguished from other products.

2. The isotopic identification of Claim 1 wherein said concentrations of isotopes are chosen from the group of isotopic concentrations consisting of concentrations of isotopes, concentrations of isotopes and their errors, ratios of isotope concentrations and ratios of isotope concentrations and their errors.

3. The isotopic identification of Claim 1 wherein said readable form is chosen from the group of readable forms consisting of serial numbers, bar codes, and other numerical indicia.

4. The isotopic identification of Claim 1 wherein said mathematical array is chosen from the group of mathematical arrays consisting of a list of a plurality of concentrations, a list of a plurality of isotopic ratios, a list of a plurality of mathematical products of isotopic

concentrations, a list of a plurality of mathematical products of isotopic ratios, groups of any such lists, groups of any such mathematical products, groups of any such ratios, groups of any such concentrations, mathematical products of any such concentrations plus or minus their error added, mathematical products of any such ratios plus or minus their error added, any such concentrations, ratios, lists, groups, and mathematical products in quadrature, isotopic ratios of any such mathematical products, ratios of said concentrations plus or minus their errors added, any of such concentrations plus or minus their errors added, factor analysis of any such concentrations, ratios, lists, groups, mathematical products and any determinants and combinations thereof.

5. The isotopic identification of Claim 1 wherein the isotopes available are any of the 224 existing stable isotopes of known elements.

6. The isotopic identification of Claim 1 wherein said isotopes are of any of the 13 stable isotopes of the elements carbon, hydrogen, oxygen, nitrogen and sulfur.

7. The isotopic identification of Claim 1 wherein the error of identification is chosen by the mathematical array chosen, the number of concentrations of isotopes utilized in said array, and the portion of said array compared with the isotopic analysis of an unknown product.

8. The isotopic id ntification of Claim 1 wherein the product from which the concentrations of isotopes are analyzed and formed into a

mathematical array includes active pharmaceutical ingredients, excipients of drug products, impurities in drug products, raw materials and drug products, combustible fuels, additives to combustible fuels, environmental and natural occurring products, explosives and ammunition, gun powder, crude oil, petroleum distillates, hazardous waste, paper, ink, tire materials, paints and other coatings.

9. The isotopic identification of Claim 1 wherein said concentrations of isotopes are chosen from the group of concentrations of isotopes consisting of bulk phase analysis and specific compound analysis.

10. The isotopic identification of Claim 9 wherein said bulk phase analysis includes dual inlet isotope ratio mass spectrometry (irMS) and on-line combustion coupled with high resolution isotope ratio monitoring/mass spectrometry (irmMS).

11. The isotopic identification of Claim 9 wherein specific compound analysis includes gas chromatography coupled with irMS (irmGCMS) and liquid chromatography coupled with irMS (irmLCMS).

12. The isotopic identification of Claim 1 wherein said analyses includes nuclear magnetic resonance.

13. The isotopic identification of Claim 1 wherein said readable form is a machine readable form and said product information is stored in memory on a machine together with the index, said machine readable

form, index and product information being int rlinked, said machine readable form once identified through the index presents stored product information in displayed form.

14. The isotopic identification of Claim 13 wherein said product information may be scrolled through.

15. The isotopic identification of Claim 13 wherein said product information may be printed.

16. The isotopic identification of Claim 13 wherein said product information may be accessed through said index from said machine readable form of said mathematical array.

17. The method of identifying products comprising the steps of analyzing a product for the concentration of isotopes, arranging the concentrations of said isotopes in a mathematical array, formulating said mathematical array in a readable form, assembling product information, indexing said product information and said readable form to an index, maintaining said index and said product information.

18. The method of Claim 17 further comprising the step of measuring the concentration of said isotopes in a comparable substance and comparing the concentrations of isotopes with the mathematical array in readable form to identify the product.

19. The method of Claim 17 further comprising the step of indexing said readable form to said product information.

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20. The method of Claim 17 further comprising maintaining said index and said product information.

21. The method of Claim 17 wherein said readable form is a machine readable form of said mathematical array, said product information is made on a machine, said machine readable form being indexed to said product information.

22. The method of Claim 21 wherein said product information may be displayed by identifying said machine readable form and indexing the same to said product information.

23. The method of Claim 21 wherein said product information may be scrolled and/or downloaded or printed as desired.

24. The method of Claim 21 further comprising measuring the concentration of said isotopes in a comparable substance and comparing the isotopic concentrations with said mathematical array of said product.

25. The method of Claim 24 wherein said mathematical array includes ratios, concentrations, and products and said comparing step comprises comparing each of said ratios, concentrations or products step by step to identify said unknown product within the error desired.

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26. The method of Claim 24 wherein said concentrations of isotopes are chosen from the group of isotopic concentrations consisting of concentrations of isotopes, concentrations of isotopes and their errors, and ratios of isotope concentrations, ratios of isotope concentrations and

their errors.

27. The method of Claim 24 wherein said readable form is chosen from the group of readable forms consisting of serial numbers, bar codes, and other numerical indicia.

28. The method of Claim 24 wherein said mathematical array is chosen from the group of mathematical arrays consisting of a list of a plurality of concentrations, a list of a plurality of isotopic ratios, a list of a plurality of mathematical products of isotopic concentrations, a list of a plurality of mathematical products of isotopic ratios, groups of any such lists, groups of any such mathematical products, groups of any such ratios, groups of any such concentrations, mathematical products of any such concentrations plus or minus their error added, mathematical products of any such ratios plus or minus their error added, any such concentrations, ratios, lists, groups, and mathematical products in quadrature, isotopic ratios of any such mathematical products, ratios of said concentrations plus or minus their errors added, any of such concentrations plus or minus their errors added, factor analysis of any such concentrations, ratios, lists, groups, mathematical products and any determinants and combinations thereof.

29. The method of Claim 24 wherein the isotopes available are any of the 224 existing stable isotopes of known elements.

30. The method of Claim 24 wherein said isotopes are of any of

the 13 stable isotopes of the elements carbon, hydrogen, oxygen, nitrogen and sulfur.

31. The method of Claim 24 wherein the error of identification is chosen by the mathematical array chosen, the number of concentrations of isotopes utilized in said array, and the portion of said array compared with the isotopic analysis of an unknown product.

32. The method of Claim 24 wherein the product from which the concentrations of isotopes are analyzed and formed into a mathematical array includes active pharmaceutical ingredients, excipients of drug products, impurities in drug products, raw materials and drug products, combustible fuels, additives to combustible fuels, environmental and natural occurring products, explosives and ammunition, gun powder, crude oil, petroleum distillates, hazardous waste, paper, ink, tire materials, paints and other coatings and other synthetic materials.

33. The method of Claim 24 wherein said concentrations of isotopes are chosen from the group of concentrations of isotopes consisting of bulk phase analysis and specific compound analysis.

34. The method of Claim 33 wherein said bulk phase analysis includes dual inlet isotope ratio mass spectrometry (irMS) and on-line combustion coupled with high resolution isotope ratio monitoring/mass spectrometry (irmMS).

35. The method of Claim 33 wherein specific compound

analysis includes gas chromatography coupled with irMS (irmGCMS) and liquid chromatography coupled with irMS (irmLCMS).

36. The method of Claim 24 wherein said analyses includes nuclear magnetic resonance.

37. The method of Claim 24 wherein said readable form is a machine readable form and said product information is stored in memory on a machine together with the index, said machine readable form, index and product information being interlinked, said machine readable form once identified through the index presents stored product information in displayed form.

38. The method of Claim 37 wherein said product information may be scrolled through.

39. The method of Claim 37 wherein said product information may be printed.

40. The method of Claim 37 wherein said product information may be accessed through said index from said machine readable form of said mathematical array.

more claims